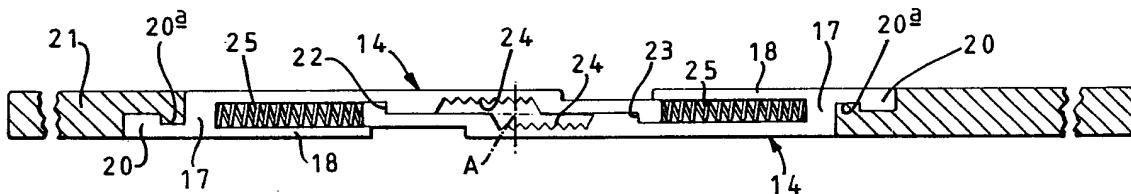




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(54) Title: SHUTTER SECURING MEANS



(57) Abstract

A roll-top cabinet (10) has one of the slats (13) of its roller-shutter assembly provided with securing means in the form of a pair of rack plates (14), mutually inverted and reversed, with attached end rods (21) arranged to be extended or retracted in relation to respective cut-away portions of guide channels for the slats at opposite sides of the cabinet. The rack plates are arranged so that a compression spring (25) in a cavity (19) in one rack plate acts on part of the other rack plate, and vice versa, so that normally the rack plates are biased away from each other and the ends of the rods engage in said cut-away portions respectively. Engagement of a splined key (29) with the racks (24) of the rack plates and subsequent rotation moves the plates towards each other and withdraws the ends of the rods thereby releasing the roller-shutter.

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SHUTTER SECURING MEANS

This invention relates to shutter securing means.

Various mechanisms have been produced for locking/securing shutters, for example the shutter of a roll-top desk or cabinet, in a closed position, so that access to, for example, the interior is prevented for an unauthorised person, e.g. someone without a key. However, such mechanisms have either been relatively complicated and/or have been ineffective against tampering.

The object of the invention is to provide shutter securing means in an effective and convenient form.

According to the invention shutter securing means comprises a shutter slat, an operating element at one side of or within the slat, the operating element having a rack, and means at the slat for a rack engaging member operatively to engage with the rack so that, in use, the rack engaging member can move the operating element between a first position in which there is a projection outwardly beyond an end of the slat, and a second position in which the projection is withdrawn inwardly of its first position.

Preferably in its second position the projection is withdrawn inwardly of said end of the slat.

As used herein, the expression 'withdrawn inwardly' of said end of the slat includes the end of the projection and the said end of the slat being flush.

The invention will now be described, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 is a schematic, perspective view showing a cabinet with a slatted shutter incorporating securing means of the invention,

Figure 2 is a front view of a slat of the slatted shutter of Figure 1,

Figure 3 is a rear view of the slat of Figure 2,

Figure 4 is an enlarged, broken view of parts of the securing means of the invention,

Figure 5 is a further enlarged, front view of one part of the securing means,

Figure 6 is a side view of the part shown in Figure 5,

Figure 7 shows a key for operating the securing means, and

Figure 8 is a view similar to Figure 4, showing parts of securing means constructed in accordance with an alternative embodiment.

Figure 1 shows a cabinet 10 having a sliding shutter 11 for closing its top and front areas. The sliding shutter is generally of conventional form, being made up of a plurality of interlocking, flexible, plastics material slats 12, opposite ends of the slats respectively being received in respective channels running around the opposite sides of the top and front areas of the cabinet. The channels thus form guides to allow a controlled sliding of the shutter.

The present invention relates to an improved shutter securing means and this will now be described. As shown in Figure 1, one of the slats 13 is different from the remainder of the slats 12, in that whilst the hollow slats 12 are empty, the slat 13 has a pair of operating elements in the form of rack plates 14 therein, and also has a plastics moulded escutcheon 15 over a hole 15a through a front face of the slat 13, the escutcheon having an integral inward collar extending slightly into the hole to act as a guide. An aligned hole 15b extends through the rear face of the slat 13.

The two rack plates 14 are shown in Figure 4. They are of identical form and shown in detail in Figures 5 and 6. Preferably they are made of glass filled nylon, but other plastics material could be used. Each rack plate has an elongated main body part 16 with an end wall part 17 normal thereto. From the part 17 a wall 18 extends back over the main body part, being spaced therefrom to define an open spring cavity 19. A further wall 20 extends from the end wall part 17 in the opposite direction to define an undercut 20a for engagement of a complementary shaped end of a rod 21, in the form of a plastic extrusion. An alternative material for the rack plates is a zinc based alloy (Mazak 3), or other suitable metal.

The body part 16 has a stop surface 22 at the open end of the spring cavity and a further stop surface 23 adjacent its end remote from the spring cavity. The surfaces 22 and 23 are normal to the length of the body portion and are parallel to the part 17. Between the surface 22, 23 is a recessed toothed rack 24.

As shown in Figure 4, the two identical rack plates are mutually inverted and reversed, so that the two racks are facing but, in their rest positions,

slightly offset. Each surface 22 of one rack plate is engaged the surface 23 of the other rack plate, with a coiled compression spring 25 in each spring cavity forcing the surfaces together by bearing against the end wall 17 of a rack plate. The length and height of the free end of each rack plate is such as to close the open end of the spring cavity in which it is received, so that the spring is retained therein lengthwise.

When the assembled rack plates and compression springs are within the slat 13, the axis of the hole 15a is aligned with the point 'A' shown in Figure 4. This is midway between the two racks in a plane normal to surfaces 22, 23 and equi-distant from the surfaces 23 of the respective rack plates. In this 'rest' position of the rack plates the two rods 21 attached thereto respectively project out of the respective opposite ends of the slat 13, as shown in Figures 2 and 3.

The rear face of the slat 13 has two elongated slots 26 adjacent its opposite ends. Through the slots project respective pan headed screws 27 which are received in respective ones of the rods 21. The screws are at the outer ends of the slots respectively in the rest position of the rack plates. Headed pins could be used instead of screws.

When fitted in the shutter 11, the slat 13 is interconnected with the slats 12 in the conventional manner, a lower part 28 engaging with a suitably shaped part of the slat 12 below it, and an identical lower part of the slat 12 above it engaging with the upper part of the slat 13.

The opposite channels of the cabinet are cut-away transversely at the position where the slat 13 is disposed in the fully closed shutter position, shown in

Figure 1. Thus the two rod ends project into said cut-away portions respectively, towards the side walls of the cabinet, and prevent the slat 13 moving by their engagement against the respective channel parts thereabove.

Figure 7 shows a rack engaging member in the form of a key 29 having an end part formed with splines 30 which match the teeth of the racks 24, the end part being sized to fit the hole 15a and engage with both racks simultaneously, the central axis of the key being at point 'A'. The rear of the key protrudes out of hole 15b.

Accordingly, in use, with the shutter 11 closed, the rack plates are held in their rest positions by the springs 25 and the rods are thus held extended behind and beneath the channels in the cabinet. Accordingly, the shutter is restrained against opening and it is not possible to tamper with the mechanism to open it with simple items such as paper clips or the like in view of the racks 24.

On inserting the key 29 through the escutcheon, the splines 30 engage the rack teeth on both racks and upon rotation of the key clockwise, as viewed in Figure 4, the racks move in opposite directions against spring bias, drawing the rods 21 inwardly of the slat 13, and thus out of the cut-away portions. Once the screws 27 engage the respective inner ends of the slots 26, the key cannot be turned further and the end of the rods are preferably flush with or inward of the respective ends of the slat 13. Accordingly, the shutter can now be raised to open the cabinet, the ends of the slat 13 sliding in the cabinet channels in the same manner as the slats 12. The key need not be retained further in the hole 15a since the rods, although urged outward by the springs,

are no longer aligned with the respective opposite cut-away parts of the channels and cannot move out of the slat. The shutter can thus be opened as much as required.

When the shutter is fully closed, the rods are automatically urged outwardly into the respective cut-away channel regions, thereby once more securely retaining the shutter closed.

Without an implement which matches the size of the key end and has a spline/splines matching the splines 30, it is considered very difficult if not impossible to gain unauthorised entry to the closed cabinet.

An alternative form of mechanism is shown in Figure 8. Here two rack plates 31, similar to those in Figures 4-6, are shown, arranged as in Figure 4. However, here no springs are provided. Instead each rack plate 31 has a triangular or other shaped projection 32 directed inwardly at the free end of its wall 18. Additionally, the outer surface 33 of the part of each rack plate which slides in a spring chamber, has two spaced complementary V-shaped recesses 34, 35 therein respectively to snap-fit with the projection. The recess 34 is at the free end of surface 33 and the recess 35 is at a shoulder 33a at the inner end of surface 33.

Accordingly in use, the rest position of the rack plates 31 is that shown in Figure 8, where the rods 21, not shown, as in the first embodiment, extend out of the ends of the slat 13. On inserting the key, it engages the racks of the rack plates 31 and moves them in opposite directions, thus withdrawing the rods to allow the shutter to slide. The rack plate movement is such that each projection 32 moves out of its recess 34 and snap fits in its recess 35, corresponding to the required

inward position of the rods. The key can be withdrawn once the snap-fit occurs and the shutter can then be opened.

To close the shutter, it is brought to its fully closed position and the key then inserted and turned to move the projections 32 out of their recesses 35 and back into their recess 34, whereupon the rods extend to engage in the cut-aways in the cabinet channels. The key is then removed.

As will have been gathered, the inner stops, when withdrawing the rods, can be provided, in both embodiments, by the screws engaging the inner ends of their slots, and/or the ends of the walls 18 engaging the shoulders 33a at the inner end of the surface 33.

During production of a rack plate, a membrane approximately 0.75 mm thick can be formed between body part 16 and wall 18 to keep them apart, the membrane being pierced when manufacture is complete.

CLAIMS

1. Shutter securing means comprising a shutter slat, an operating element at one side of or within the slat, the operating element having a rack, and means at the slat for a rack engaging member operatively to engage with the rack so that, in use, the rack engaging member can move the operating element between a first position in which there is a projection outwardly beyond an end of the slat, and a second position in which the projection is withdrawn inwardly of its first position.
2. Shutter securing means as claimed in Claim 1, wherein in its second position the projection is withdrawn inwardly of said end of the slat.
3. Shutter securing means as claimed in Claim 1 or Claim 2, wherein in said first position respective projections extend outwardly from opposite ends of the slat.
4. Shutter securing means as claimed in Claim 3, comprising two operating elements with respective racks, the operating elements moving in opposite directions when the rack engaging member engages both of said racks and is moved angularly, in use.
5. Shutter securing means as claimed in Claim 4, wherein respective rods are engaged on respective complementarily undercut ends of the operating elements, said rods providing said projections from the slat in said first position thereof respectively.
6. Shutter securing means as claimed in Claim 5, wherein the rods carry respective stop members projecting

through respective elongated slots at or adjacent respective opposite ends of the slat.

7. Shutter securing means as claimed in any one of Claims 4 to 6, wherein each operating element has an open cavity at one side of its rack and a free end part at the other side of its rack, the operating elements being arranged so that, in use, the free end part of one element closes the open cavity of the other element in said first position, and is received into the cavity in said second position, the two operating elements thereby moving longitudinally together.

8. Shutter securing means as claimed in Claim 7, wherein each operating element has a first stop surface between its rack and the opening to its cavity and a second stop surface at the rear of its free end part, the operating elements being arranged so that in said first position, in use, the first stop surface of one operating element is abutted by the second stop element of the other operating element, and vice versa, so that the only movement of the elements which is possible is movement towards one another.

9. Shutter securing means as claimed in any one of Claims 4 to 8, wherein each operating element has its chamber formed with a wall with an end stop and has a third stop surface spaced longitudinally inwardly of its end part, the operating elements being arranged so that in said second position, in use, the end stop of one operating element is abutted by the third stop surface of the other operating element, and vice versa, so that only movement of the elements apart is possible.

10. Shutter securing means as claimed in Claim 9, wherein resilient means contained in the cavities of the operating elements respectively act on said free end

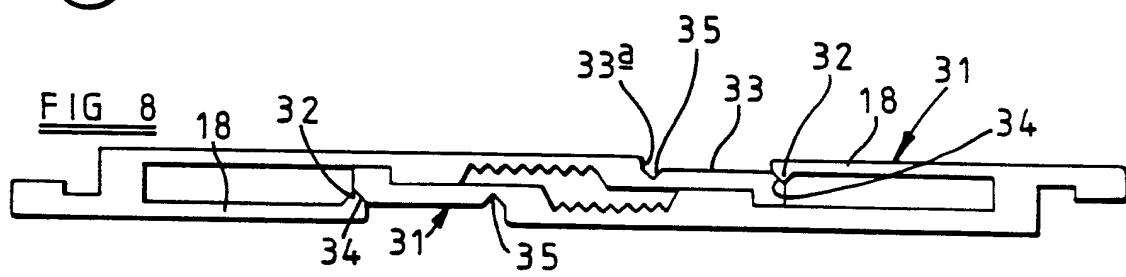
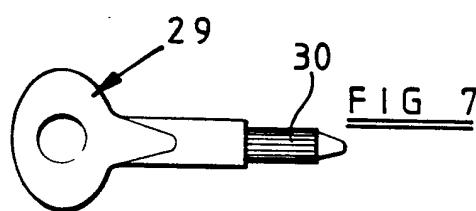
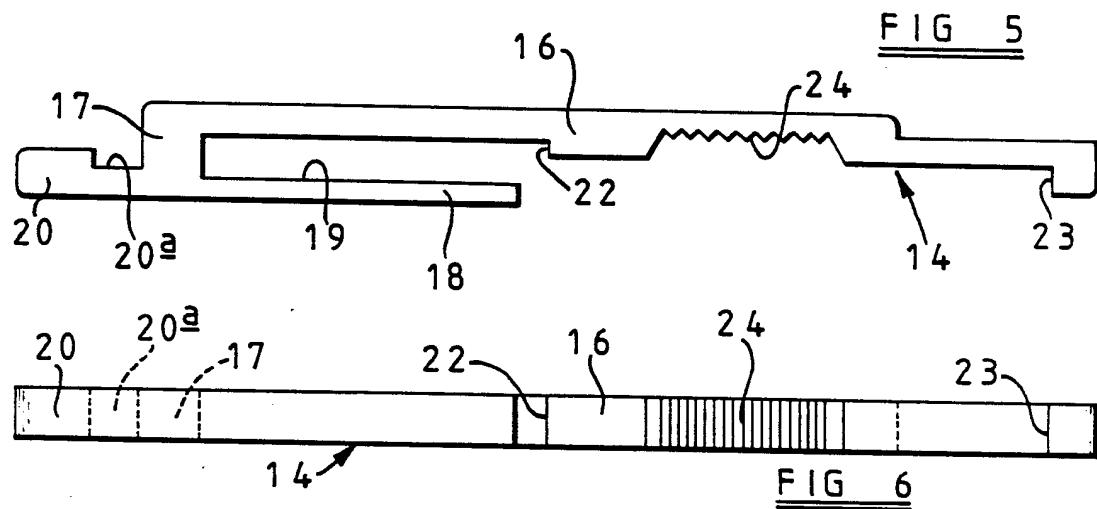
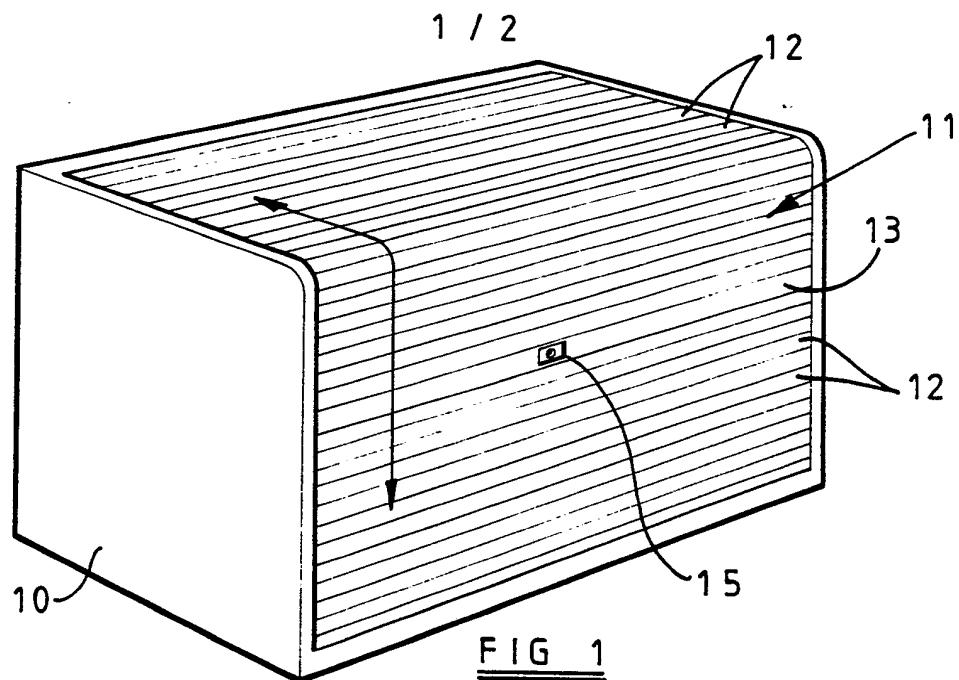
part, to bias the operating elements to said first position.

11. Shutter securing means as claimed in Claim 9, wherein said end stop of one of the operating elements is formed as a projection which in said first position engages in a recess in said free end part of the other of the operating elements, and in said second position engages in a recess at said third stop surface of the other of the operating elements, and vice versa, the projection and respective recesses snap-fittingly engaging together, in use, there being no biasing means acting on said free end parts.

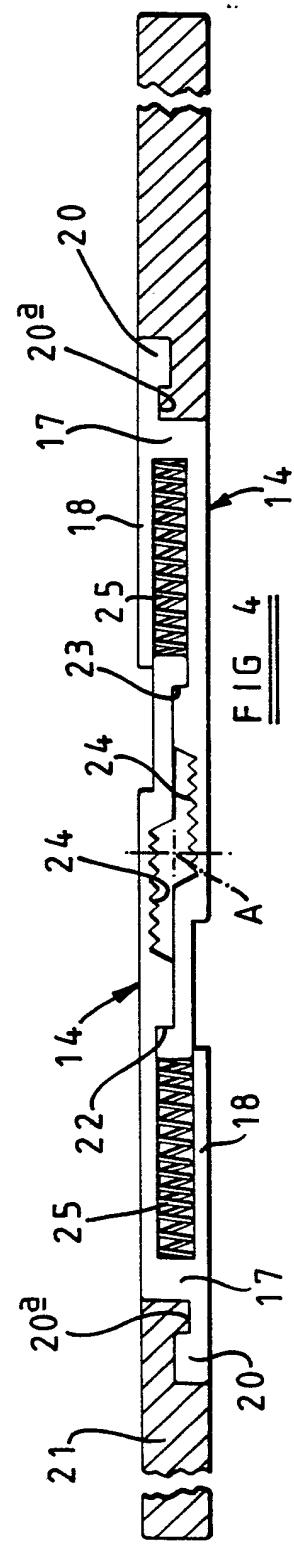
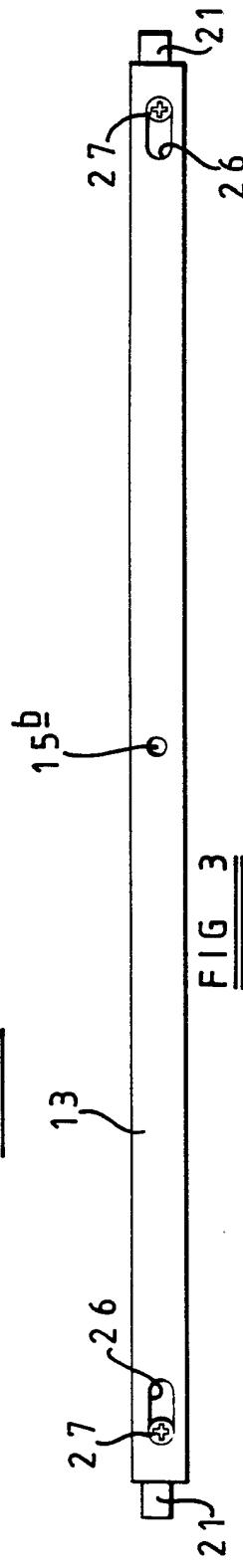
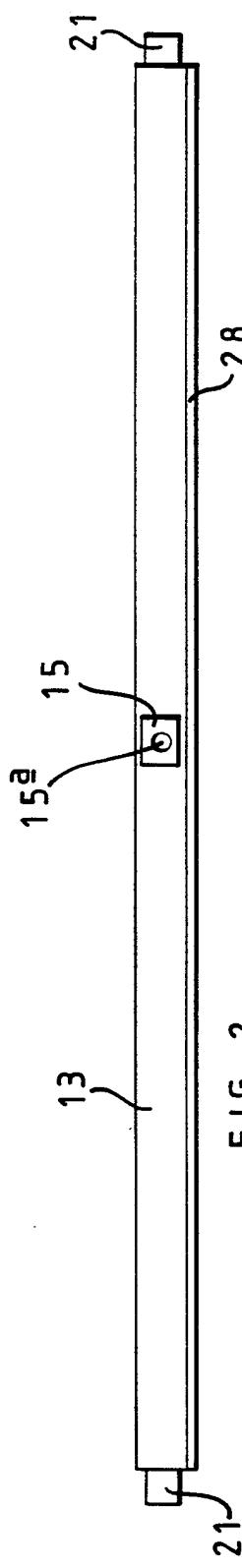
12. Shutter securing means as claimed in any one of the preceding claims, wherein the slat is hollow and the or each operating element is received within the slat.

13. Shutter securing means as claimed in Claim 12, wherein an escutcheon is secured over a hole in a front surface of the slat, which hole is adapted to receive the rack engaging member, in use.

14. A desk, cabinet or the like having a roller-shutter assembly including shutter securing means as claimed in any one of the preceding claims.



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INTERNATIONAL SEARCH REPORT

International Application No. PCT/GB 90/00565

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC⁵: E 05 C 9/04, E 05 C 9/12

II. FIELDS SEARCHED

Minimum Documentation Searched⁷

Classification System	Classification Symbols
IPC ⁵	E 05 B, E 05 C

Documentation Searched other than Minimum Documentation
to the Extent that such Documents are included in the Fields Searched⁸

III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹

Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
Y	US, A, 4182144 (LEIVENZON) 8 January 1980 see the whole document --	1-10
Y	FR, A, 1067271 (LA SERRURERIE RATIONNELLE) 14 June 1954 see the whole document --	1-10
A	DE, A, 2226199 (BRINKMANN) 6 December 1973 see figure 1 --	11
A	US, A, 1700129 (HAUSMANN) 29 January 1929 see the whole document --	11
A	FR, A, 2559826 (BRACQ) 23 August 1985 see figure 1 --	12,13
		./.

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IV. CERTIFICATION

Date of the Actual Completion of the International Search

9th July 1990

Date of Mailing of this International Search Report

06.08.90

International Searching Authority

EUROPEAN PATENT OFFICE

Signature of Authorized Officer

H. Daniels

H. DANIELS

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	GB, A, 510908 (PARRY) 7 September 1939 -----	1

ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.

GB 9000565
SA 36215

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 31/07/90. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 4182144	08-01-80	None	
FR-A- 1067271		None	
DE-A- 2226199	06-12-73	None	
US-A- 1700129		None	
FR-A- 2559826	23-08-85	None	
GB-A- 510908		None	

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TITLE: SHUTTER SECURING MEANS
PUBN-DATE: November 1, 1990

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EUR-CL (EPC): E05C009/04

US-CL-CURRENT: 292/142

ABSTRACT:

A roll-top cabinet (10) has one of the slats (13) of its roller-shutter assembly provided with securing means in the form of a pair of rack

plates (14), mutually inverted and reversed, with attached end rods (21) arranged to be extended or retracted in relation to respective cut-away portions of guide channels for the slats at opposite sides of the cabinet. The rack plates are arranged so that a compression spring (25) in a cavity (19) in one rack plate acts on part of the other rack plate, and vice versa, so that normally the rack plates are biased away from each other and the ends of the rods engage in said cut-away portions respectively. Engagement of a splined key (29) with the racks (24) of the rack plates and subsequent rotation moves the plates towards each other and withdraws the ends of the rods thereby releasing the roller-shutter.